



HERBICIDES CORRESPONDENCE COURSE

LESSON 3

Weed Control in Lawns



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WEED CONTROL IN LAWNS

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WEED CONTROL IN LAWNS

The contents of this booklet is the reproduction of Publication 529, "Weed Control In Lawns", written by F. H. Montgomery and C. M. Switzer, Department of Botany, Ontario Agricultural College, University of Guelph.

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WEED CONTROL IN LAWNS

INTRODUCTION

A weed-free lawn is the hope and ambition of most homeowners, but it is an objective that is never entirely reached. It must be remembered that a lawn is an artificial plant community and is, therefore, subject to invasion by native and foreign plants. The purpose of this publication is to assist in the identification of these invaders and to suggest how they may be controlled. Coupled with good general turf management, this will lead to a beautiful lawn.

The appearance of a weed in the lawn, where it is subjected to periodic mowing, is quite different from the same weed along a roadside or in a field. In this booklet we have tried to picture the weeds as they appear in the lawn. Therefore, in many cases they lack stems and flowers. If one wishes to see drawings of the same weeds in more advanced stages, he should refer to Publication 505, Ontario Weeds or any textbook.

It should be pointed out that recommended chemical weed control is not always 100% effective. The action of chemicals depends upon several factors such as the age of a weed, the temperature at which the chemicals are applied, the fertility of the soil and the amount of available moisture. Nor can it be expected that once the weeds are killed in a lawn, they are permanently eliminated. Seeds remaining in the soil may germinate; or new seeds may be brought in by winds, animals or topdressing. Briefly, do not expect that all weed problems will be solved by the use of herbicides. They are a great help, but complete weed control will be obtained only when they are used as part of a good lawn management program.*

CHEMICAL CONTROL

The herbicide 2,4-D has been the answer to many problems connected with the maintenance of a neat, weed-free lawn. It is inexpensive, readily available, easy to apply, and will control many of the common weed species. However, 2,4-D does not give good control of certain common lawn weeds such as mouse-ear chickweed, black medick, and creeping charlie. Fortunately other chemicals (mecoprop, dichlorprop, fenoprop, and dicamba) are available that will kill these 2,4-D-resistant plants.

Mecoprop, dichlorprop and fenoprop (Silvex) are closely related chemicals that will give excellent control of many 2,4-D-resistant weeds. Mecoprop is safe to use on all grasses, including the bent grasses, and has been widely accepted. It is very slow-acting, however, and gives only fair control of dandelions. Fenoprop (Silvex) on the other hand, kills more quickly, is effective on a wider range of weed species, but sometimes, particularly during hot weather, damages turf. Fenoprop should never be used on bent grass.

*See Publication on Lawns.

Dicamba is particularly useful for the control of knotweed in lawns. It also gives excellent control of most other weeds, with the notable exceptions of common plantain and ribgrass. Dicamba has had harmful effects on several species of shrubs commonly found near lawns. This herbicide may remain active in the soil for long periods of time and may be absorbed through the roots of susceptible woody plants. Therefore, it should not be applied within the "drip-line" of shrubbery, nor at rates higher than 8 ounces per acre. Since the rates recommended on most labels are considerably less than this, the user should have no fears about using dicamba, as long as he follows directions.

It is apparent that none of the herbicides mentioned above is effective on all of the many species of weeds found in lawns. However, mixtures of 2,4-D with mecoprop, dichlorprop, fenoprop, and/or dicamba have been found to control most lawn weeds. Such mixtures are available from most garden supply stores. Since formulations differ, it is impossible to give one overall recommendation as to the amount of products to use. Follow the manufacturers' directions on the label for best results.

WARNING

One cannot place too much emphasis on the warning that herbicides must be used as directed, and must be kept away from desirable border or garden plants. Careless mixing, spraying when the wind is blowing, holding the spray nozzle high, or using spraying or mixing equipment for any other purpose will certainly lead to unsatisfactory results or damage to desirable plants. Follow carefully manufacturers' directions given on the labels.

ESTABLISHED LAWNS

In an established lawn, most weeds can be controlled satisfactorily by following proper lawn care practices*. These include fertilization, topdressing, mowing, watering, aerifying, and the reseeding of sparse areas. The idea behind such procedures is to produce a dense, healthy turf that will compete so strongly for water, light and nutrients that weedy species cannot become established. In practice, weed-killing chemicals work extremely well when used with the cultural methods outlined above.

*See Publication on Lawns.

Most broadleaf weeds are susceptible to 2,4-D and related chemicals and most grasses are resistant. Therefore, these chemicals may be used on lawns** without any danger of injury if manufacturers' directions are followed. For small areas, a concentration of 1 ounce of pure*** 2,4-D acid in 4 gallons of water is suggested. (See specific recommendations for different weeds.) Apply this solution to thoroughly wet the weeds. Four gallons should cover about 2,500 square feet.

NEW LAWNS

When establishing a new lawn, the possibility of having a weed problem in the established turf should be considered before the land is prepared for seeding. Thorough cultivation at intervals during the summer before planting is desirable. The roots or underground stems of such weeds as quack grass, creeping charlie, and bindweed should be shaken out of the seedbed with a fork before planting. Chemical treatments such as fumigation with methyl bromide, treatment with granular cyanamid, or drenching with allyl alcohol, or vapam may be used before planting, but they are costly; methyl bromide must be used only by an experienced operator because it is an extremely poisonous gas. The use of methyl bromide is subject to the Pesticides Act and Ontario Regulations, Ministry of the Environment.

Many annual weeds may emerge before the grass seedlings. If these are not controlled they will shade and eventually crowd out much of the grass population. Mowing with the mower set to cut as high as possible will eliminate many such weeds. If they are extremely thick, 2,4-D at one-half the usual rate (1 oz in 8 gal of water per 2,500 sq ft) or mecoprop (1 oz in 4 gal per 2,500 sq ft) can be used, but not before the grass has been up at least four weeks.

During the early development of a lawn the grass should not be cut too short. When most of the leaf surface of a grass plant is removed, a deep and extensive root system cannot be produced. In such an event the grass will not be able to compete with weeds or weedy grasses for water and nutrients, and the weeds will soon take over. A similar problem will develop if superficial watering or poor fertilization practices are carried out.

**Neither 2,4-D nor fenoprop (Silvex) should be used on bent grass. Mecoprop may be used. Follow manufacturers' directions.

***All rates given in this publication are based on pure herbicides, not on commercial material.

METHODS OF APPLICATION

A small hand sprayer is the best for applying 2,4-D and related chemicals, although a sprinkling can may be used. The utensil used to apply these chemicals should be reserved for weed sprays only, since they are difficult to remove completely from a sprayer even by repeated washings and the most minute quantities left may damage many ornamental plants if the sprayer is used to apply fungicides or insecticides at a later date.

Herbicide damage also may occur from spray drift or from spray vapors, therefore, spraying with low pressures at a time when there is little or no wind and using an amine formulation of 2,4-D rather than an ester will reduce this danger. Similar precautions must be taken with mecoprop, dichlorprop, fenoprop and dicamba. Liquids also may be applied by means of gravity-flow spreaders (no pressure used) or by using a hose-end unit. The former device decreases the possibility of herbicide drift, the latter increases it.

Although spraying is the best and least expensive method of treatment, other methods have been and are being tried in an effort to increase convenience and reduce the possibility of injury to desirable plants. Granular formulations are available which may be applied dry with a fertilizer spreader. Also, mixtures of granular herbicides with fertilizer are available. Such mixtures give good weed control and are convenient to the homeowner since only one operation is required to both fertilize and weed the lawn. Granular materials should be applied in two directions at right angles to each other to obtain complete coverage.

Various formulations are available as aerosols for spot-treatment of lawn weeds. Relative to spraying this is an expensive way to apply herbicides, but it is convenient and has a place when only a few scattered weeds are present in the lawn.

WARNING

Do not use 2,4-D, fenoprop (Silvex) or dicamba on bent grass or newly-seeded lawns. Mecoprop may be used at one-half the usual rate at temperatures under 80°F.

TIME OF SPRAYING

Regardless of the type of application, best weed control by 2,4-D and related herbicides is obtained when the treated plants are growing rapidly. In general, the younger a plant is, the more susceptible it is to these chemicals; so the sooner the spray can be applied after weeds emerge, the more effective will be the control. Therefore, treatment should be carried out in May or early June, or in September, or at both times if the weed population warrants it. Fall spraying has an additional safety advantage since most cultivated plants in gardens and borders are less sensitive to sprays at this time than in the spring. Also, fall spraying ensures that the lawn will be free of dandelions the next spring.

Herbicides should not be applied during the hot days of summer as damage to the turf grasses may occur.

CLOVER IN LAWNS

If clover is desired in a lawn, 2,4-D must be used with caution. The rate of this chemical recommended for most weeds will check the growth of clover and perhaps thin the stand in an established lawn, but will not eradicate it.

Many homeowners regard clover as a weed, principally because it stains the clothing of children playing on the lawn. It can be eradicated easily by spraying with mecoprop, dichlorprop, fenoprop or dicamba at the rate of 1 oz in 4 gal of water per 2,500 sq ft. Any of the mixtures containing 2,4-D and one or more of these herbicides also will give excellent control.

MOSS

If moss is a problem, poor soil condition is indicated. Often shady, infertile or poorly drained areas do not support good grass growth and moss comes in. Several moss-killers are available, most of which contain iron sulfate. These will give temporary control but the conditions mentioned above must be corrected before the moss will be eliminated.

MUSHROOMS AND TOADSTOOLS

"Fairy-rings" of mushrooms are sometimes found in lawns. This is the result of rotting organic material in the soil coupled with the right conditions of temperature and moisture level. The turf often shows circular areas of injury due to the active fungus affecting the moisture supply. Control may be obtained by treating with copper sulfate (Bordeaux mixture). This mixture should be prepared by dissolving 4 lbs of bluestone in water, adding 4 lbs of hydrated lime and bringing up to 40 gal of water. The affected area is then soaked thoroughly with the solution. Penetration is enhanced if holes 4 to 6 ins deep are made in the soil with a garden fork. Retreatment is usually necessary.

There is some evidence that soaking the infested areas with plain water every day for a month may give control. Correct fertilization will help.

UNWANTED GRASSES

Several weedy grasses may appear in the lawn. Two of these, quack grass and crabgrass, will be dealt with separately. Other problem grasses usually appear in tufts or clumps. The commonest of these are orchard grass, timothy, meadow fescue, and barnyard grass. In orchard grass the stems are more or less erect, rather elliptical or flattened in cross section and there is a ligule present which has a pointed apex and somewhat fringed edges. Timothy can be recognized by the bulbous bases of the stems and the distinct notches at the sides of the ligule which occurs at the junction of the blade and the sheath. Meadow fescue stems have a purplish or reddish tinge at the base and where the sheath and the blade join there is a pair of narrow claws or auricles. The stems of barnyard grass are coarse, prostrate, and rather elliptical or flattened in cross section. The ligule found at the junction of the blade and the sheath of most grasses is absent in barnyard grass.

CONTROL

There is no chemical presently available that can be sprayed on a lawn to kill these grasses without damaging the desirable species. It has been suggested by some that grass killers such as dalapon or amitrole might be "painted" on individual blades of these grasses, thus avoiding the surrounding turf grasses. This technique does work but it is so time-consuming that it is impractical for most people. Maintenance of a dense, healthy turf tends to discourage these weedy grasses and over a period of two or three years should give satisfactory control. If one wants immediate results, the best method is to dig out isolated patches and reseed or resod.

CREEPING BENT GRASS (*Agrostis* spp.) sometimes is found in patches in lawns where it may crowd out other species. It is most likely to be a problem in lawns that are lightly sprinkled at frequent intervals. Repeated treatment with fenoprop (Silvex) (1 oz in 4 gal per 2,500 sq ft) followed by topdressing with soil and reseeding will give satisfactory control.

Various annual grasses (such as crabgrass, foxtail, old witchgrass, and barnyard grass) are found in many lawns, particularly if the turf is thin. The best method of chemical control is to use one of the preemergence chemicals as described for crabgrass.

TABLE 1 A SUMMARY OF HERBICIDES USED TO CONTROL LAWN WEEDS

| WEED | GROWTH* HABIT | HERBICIDE** | REMARKS |
|--------------------------|------------------|-----------------|--------------------|
| Bedstraw | p | mixtures | repeat treatment |
| Bellflower | p | ----- | hard to kill |
| Bindweed | p | 2,4-D | repeat treatment |
| Black Medick | wa | mixtures | treat in June |
| Blueweed | b | 2,4-D, mixtures | repeat treatment |
| Buttercup (Creeping) | p | MCPA, mixtures | repeat treatment |
| Chickweed (Common) | a | mixtures | readily controlled |
| Chickweed (Mouse-ear) | p | mixtures | readily controlled |
| Cinquefoil (Silvery) | p | 2,4-D, mixtures | repeat treatment |
| Crabgrass | a | see page 10 | preemergence |
| Creeping Charlie | p | mixtures | treat when young |
| Daisy Fleabane | wa | 2,4-D, mixtures | treat when young |
| Dandelion | p | 2,4-D | readily controlled |
| Dandelion (Fall) | p | 2,4-D | readily controlled |
| Dock (Curled) | p | 2,4-D, mixtures | treat when young |
| English Daisy | p | mixtures | repeat treatment |
| Goutweed | p | ----- | hard to kill |
| Hen kweed | p | 2,4-D, mixtures | repeat treatment |
| Heal-all | p | mixtures | treat when young |
| Knotweed (Prostrate) | a | dicamba | treat when young |
| Mallow (Round-Leaf) | p | mixtures | hard to kill |
| Moss | p | iron sulfate | improve turf |
| Oxeye Daisy | p | 2,4-D, mixtures | treat when young |
| Plantain (Common) | p | 2,4-D | readily controlled |
| Plantain (Ribgrass) | p | 2,4-D | readily controlled |
| Quack Grass | p | ----- | try to crowd out |
| Sandwort | a | mixtures | readily controlled |
| Shepherd's Purse | wa | 2,4-D | treat when young |
| Speedwell (Thyme-leaved) | p | mixtures | treat when young |
| Speedwell (Corn) | a | mixtures | hard to kill |
| Speedwell (Purslane) | a | mixtures | treat when young |
| Stonecrop | p | mixtures | treat when young |
| Toadstools | p | copper sulfate | improve turf |
| Yarrow (Milfoil) | p | mixtures | hard to kill |

*a annual, b-biennial, p-perennial, wa winter annual.

**"Mixtures" refers to commercially available combination of 2,4-D with mecoprop, dichlorprop, fenoprop and/or dicamba. If using 2,4-D alone use a rate of 1 oz of active chemical in 4 gal of water on 2,500 sq ft of lawn. If using one of the mixtures, carefully follow the manufacturers' directions.

QUACK OR TWITCH GRASS, Agropyron repens (L.) Beauv.

This grass is easily distinguished from other weedy lawn grasses by the ramifying, whitish, jointed, underground rhizomes. It spreads throughout the lawn by producing new shoots and roots at the nodes (joints) of the rhizomes. A second identifying feature is the prominent, fingerlike appendages (auricles) at the junction of the leaf-blade and the stem. Both characteristics should be looked for in identifying the grass.



QUACK GRASS

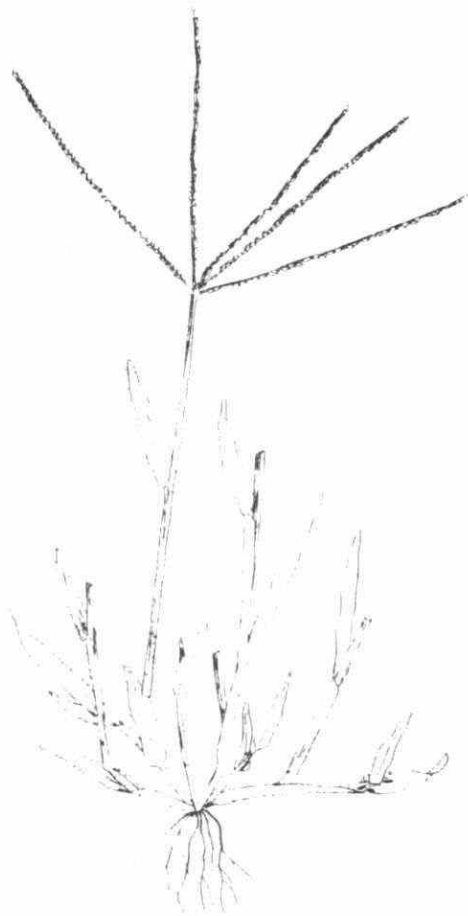
CONTROL: Quack grass is resistant to 2,4-D and related herbicides, and cannot be selectively controlled in lawns by chemical means. Fortunately, it is not able to compete well with a vigorous stand of lawn grasses. Over a period of years quack grass will be crowded out if a good program of turf management is followed.

If a new lawn is planned, care should be taken to eliminate quack grass before seeding. This may be done by persistent cultivation or by shaking out the rhizomes with a fork. Two chemicals, amitrole (amino triazole) and dalapon, at 4 oz per 1,000 sq ft, have also been found effective. Either of these herbicides should be applied to the quack grass foliage during active growth. The area should be plowed one to two weeks later. Because both materials may render the soil toxic to lawn grasses for some time after treatment, at least six weeks should elapse before the lawn is seeded.

CRABGRASS, Digitaria spp.

Two species of crabgrass may be found in lawns, the hairy crabgrass and the smooth crabgrass. Their general appearance is similar, but the former species, as the name implies, is covered with obvious hairs. The stems lie close to the ground and often root at the nodes. This prostrate feature makes it difficult to cut with the lawn mower. The leaves are short and broad and rather yellow-green when young, but often become purplish with age. The flowering structure consists of four to twelve fingerlike branches at the top of the stem. The flowers are on one side of the continuous branch and contain only one seed.

The smooth crabgrass lacks hairs on the leaves and the fruits are darker.



CRABGRASS

CONTROL: Both kinds of crabgrass are found only where the turf is thin and where there is much sunlight. Cultural measures such as mowing with the mower set to cut high ($1\frac{1}{2}$ to 2 inches), adequate water, and the use of fertilizers to improve the turf, will do much to eliminate crabgrass.

Certain chemicals will also help control this weed. The most effective are those that are applied before the crabgrass seedlings emerge (preemergence treatment). In Ontario, emergence of crabgrass seedlings generally occurs during the first weeks of May, so treatment should be made in April or very early May.

Late fall (October or November) applications of certain preemergence herbicides also have given excellent control of crabgrass in lawns. (See below.)

Chemicals for the control of crabgrass are available in both liquid and granular formulations. The granular materials may be distributed by means of a fertilizer spreader. Most are now also available as mixtures with fertilizer, so the two operations may be carried out at one time. It is advisable to divide the required amount of chemical into two and spread one portion at right angles to the other to ensure uniform distribution.

Many preemergence chemicals have been tested during the past few years. Several of these have been shown to be effective and are listed below.

Azak is available as a wettable powder or in fertilizer mixtures. Use at 10 lbs (active) per acre or $\frac{1}{4}$ lb (active) per 1,000 sq ft. Use in early spring.

Bensulide (Betasan) may be used as a liquid, a granular or mixed with fertilizer. Use at 15 lbs (active) per acre or $\frac{1}{3}$ lb (active) per 1,000 sq ft. Both spring and fall treatments have been satisfactory.

Dacthal is sold as a granular, in fertilizer mixtures, and as a wettable powder (for spray application). It should be applied at the rate of about $\frac{1}{3}$ lb active chemical per 1,000 sq ft (15 lbs per acre) early in the spring or late in the fall.

Siduron (Tupersan) is available as a wettable powder and in mixtures with fertilizer. It may be used on established turf and, unlike the other preemergence crabgrass herbicides, on newly seeded lawns. Also, bare patches in an established turf may be reseeded immediately after using siduron as it is not toxic to most species of turf (Washington bentgrass is susceptible). Application rates of 8 to 12 lbs (active) per acre are recommended. Do not use in the fall of the year.

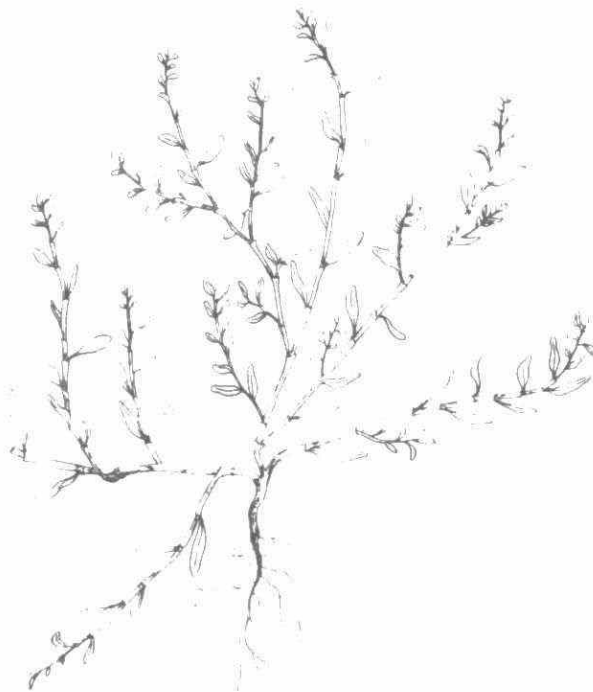
IMPORTANT: Since the percentage of active chemical differs in the various commercial formulations available, the manufacturers' directions and cautions given on the labels must be followed.

PROSTRATE KNOTWEED, Polygonum aviculare L.

This is an annual weed with prostrate, rather wiry stems spreading over the surface of the ground. The leaves are small, without petioles and with whitish or pinkish sheaths at the junction of the stem and the leaves. The flowers are small, whitish or pinkish and formed in the sheaths. The fruit is buckwheat-like. Knotweed is chiefly a problem in compacted or thin areas in lawns and along driveways or edges of sidewalks where walking or tires may make it difficult for grass to grow.

CONTROL: Stimulate good turf growth as knotweed cannot compete with a vigorous stand of grass.

Dicamba is particularly useful for the chemical control of knotweed since this plant becomes resistant to other herbicides soon after germination. Use dicamba at 1 oz per 10 gal water per 3,500 sq ft, or, mixtures containing dicamba and 2,4-D as recommended by the manufacturer. Mixtures of 2,4-D-mecoprop or 2,4-D-dichlorprop or 2,4-D-fenoprop will give control only if used when the knotweed is very young.



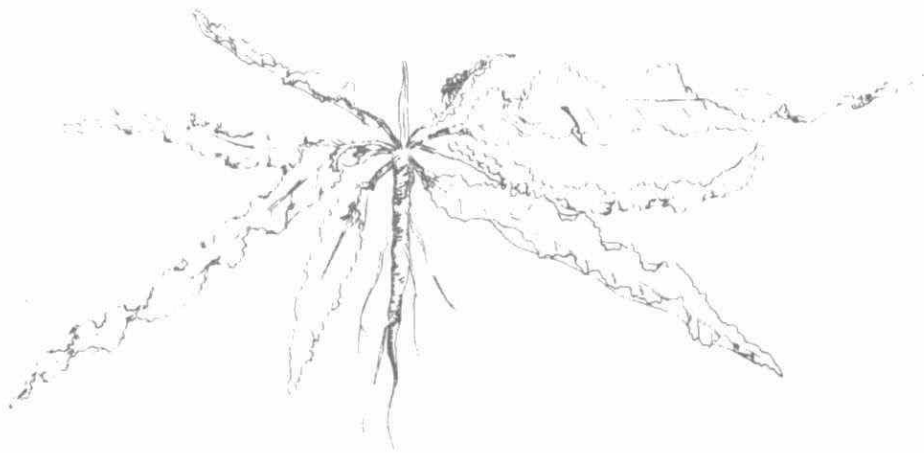
PROSTRATE KNOTWEED

CURLED DOCK, Rumex crispus L.

In well-established and well-kept lawns this weed is seldom a problem but in new lawns it is sometimes introduced with the soil.

The root is a perennial taproot. The leaves are coarse, elongated or ribbon-like with wavy or crisped margins. In lawns it seldom gets past this stage. A closely related weed, broadleaf dock, also may be found. It is similar to curled dock but has shorter, broader leaves.

CONTROL: Dig out or use 2,4-D-mixtures. Application should be made early in the spring soon after the rosette appears.

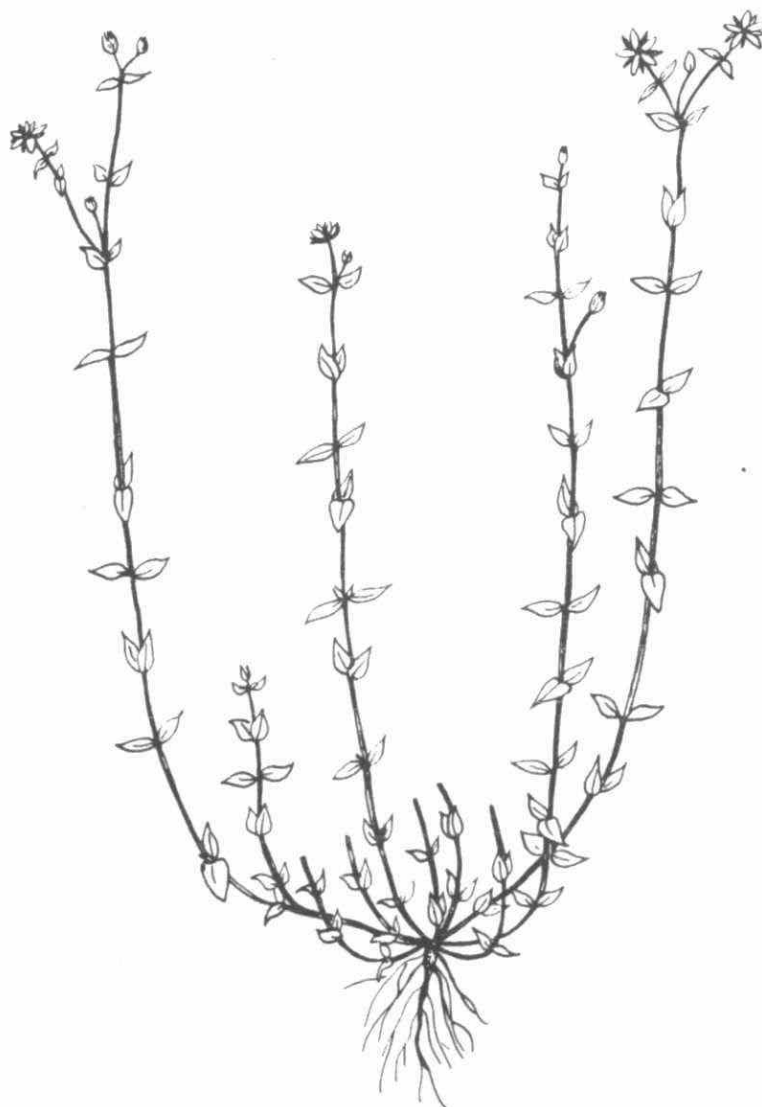


CURLED DOCK

SANDWORT, Arenaria serpyllifolia L.

The annual stems are bushy, erect or reclining and 3 to 4 inches tall. The leaves are small, oval but pointed, sessile and opposite. The flowers are small and white and the plants may flower all summer.

CONTROL: Herbicide mixtures containing 2,4-D will give good control.



SANDWORT

MOUSE-EAR CHICKWEED, Cerastium vulgatum L.

This is an annual or perennial plant forming rather dense tufts in lawns and spreading by the rooting of the stems at the nodes. The leaves are opposite, sessile, elliptical or somewhat club-shaped and covered with glandular hairs. The flowering stems are erect or reclining and the flowers have five deeply notched, white petals about as long as the sepals. The seedpods are longer than the sepals and are rather curved at the apex.

CONTROL: This weed is resistant to 2,4-D except when very young. Mecoprop, fenoprop (Silvex) or dicamba used alone, or in mixtures with 2,4-D are satisfactory.

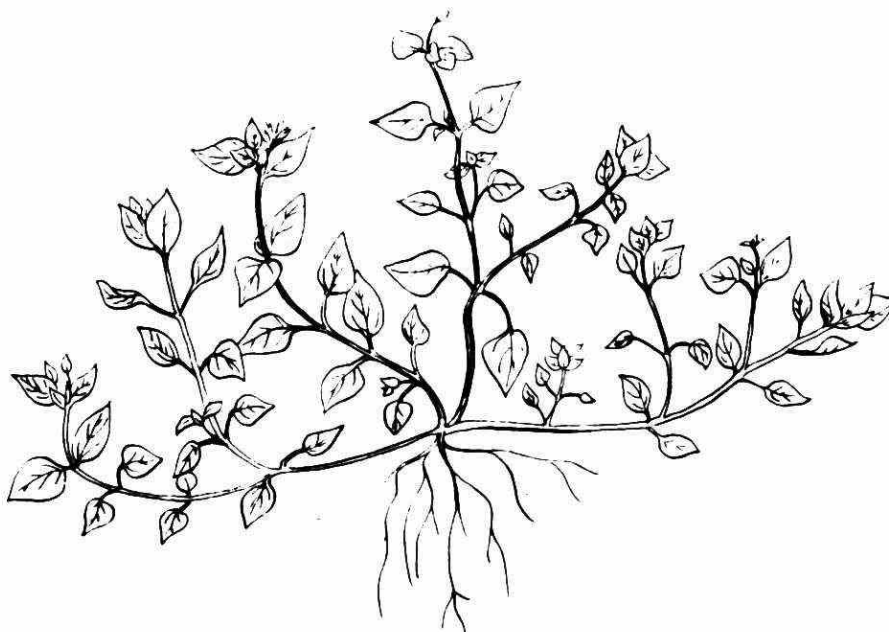


MOUSE-EAR CHICKWEED

COMMON CHICKWEED Stellaria media (L.) Cyrillo.

A low-lying, matted annual or winter-annual plant with delicate, branching stems. The leaves are opposite, oval, pointed at the tips, mostly smooth or only slightly hairy. The lower leaves are stalked but the upper ones are usually sessile. The flowers are small, white, and each petal is 2-lobed. It may start blooming in the early spring and produce flowers and seeds all the growing season.

CONTROL: Common chickweed is not as difficult to control as mouse-ear chickweed. Some success has been reported using two or more treatments of 2,4-D early in the development of the plant. The 2,4-D mixtures give excellent control with one application.

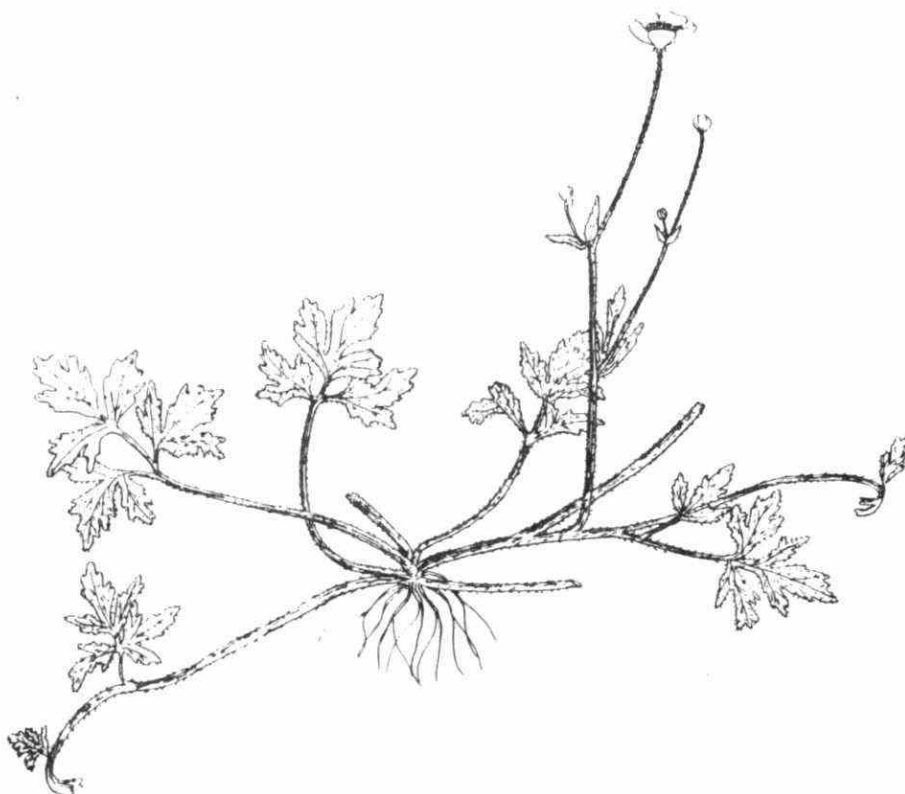


COMMON CHICKWEED

CREEPING BUTTERCUP, Ranunculus repens L.

A perennial plant with the stems trailing along the ground and rooting at the nodes. The leaves are 3-parted with the middle segment stalked and the two lateral ones sessile; each lobe is incised or toothed. The flowers are on long, leafless stalks and have 5 to 9 large, yellow petals. The fruits are in a globular cluster and each has a short, stout beak.

CONTROL: Buttercup may be controlled with 2,4-D when young, but a more satisfactory control is given by the closely related chemical MCPA. Use at 1 oz per 4 gal of water per 2,500 sq ft. The 2,4-D mixtures also are satisfactory.

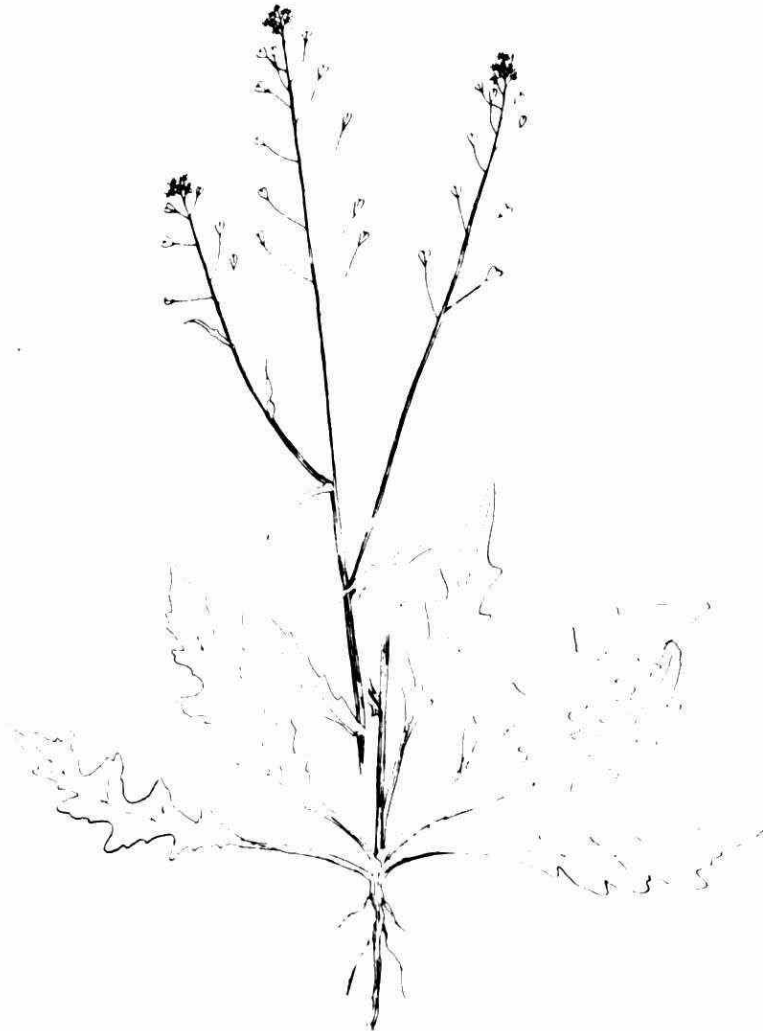


CREEPING BUTTERCUP

SHEPHERD'S PURSE, Capsella bursa-pastoris (L.) Medic.

This is a winter-annual or biennial plant with a taproot and a rosette of leaves lying flat on the ground during the first season's growth. The leaves are elongated and deeply lobed. In the second season a slender, few-leaved, flowering stem arises from the center of the rosette and produces many small, white flowers, each with four petals. The seedpods are small and heart-shaped.

CONTROL: Use 2,4-D or 2,4-D mixtures when the weed is in the seedling or rosette stage in the fall or early spring.

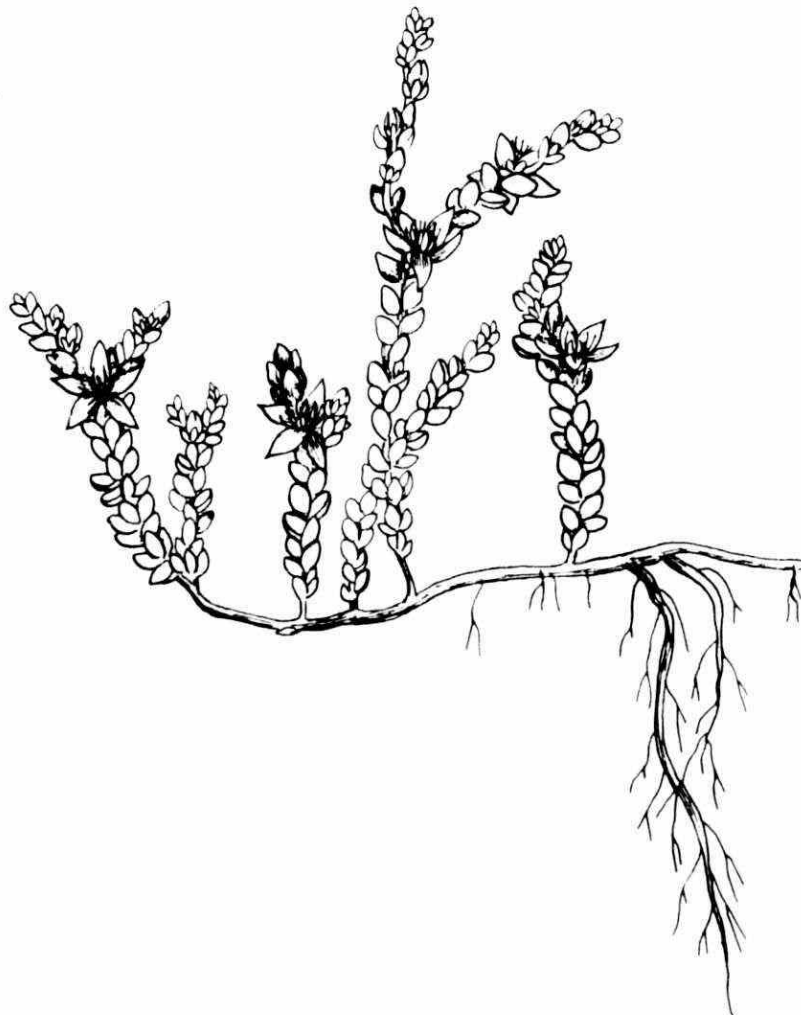


SHEPHERD'S PURSE

MOSSY STONECROP, Sedum acre L.

This is a perennial plant with densely matted, creeping stems and erect branches. The stems are covered with small, overlapping, succulent, yellowish-green leaves. The flowers are about one-half inch in diameter with five yellow petals. It is a bad lawn weed in some localities.

CONTROL: The fleshy nature of this plant and its smooth leaves make chemical control difficult. The addition of a surfactant or wetting agent (such as a small amount of soap) to a 2,4-D mixture will give better results. Application should be made early in the spring. Repeated treatments may be required.



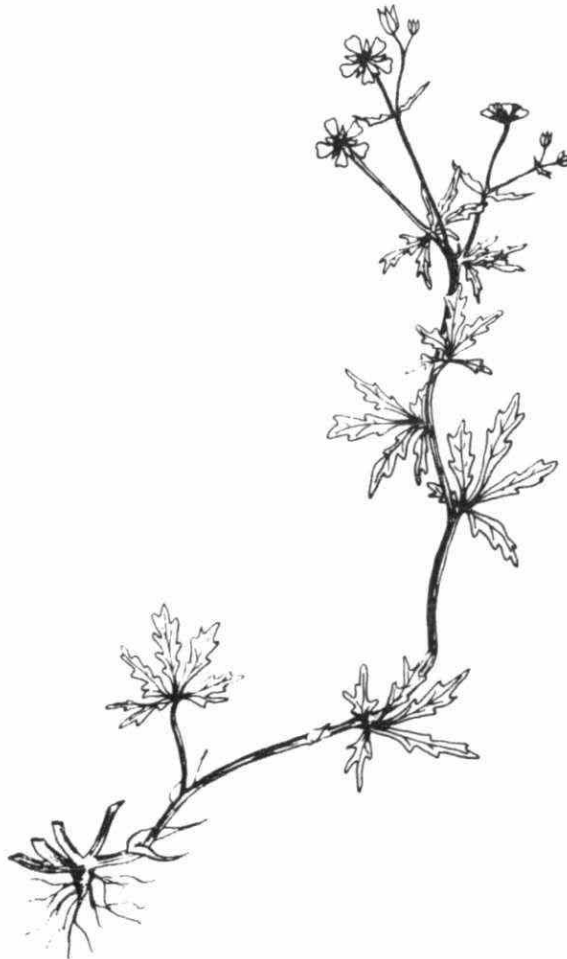
MOSSY STONECROP

SILVERY CINQUEFOIL, FIVE FINGERS, Potenilla argentea L.

The stems usually lie close to the ground but may become erect at flowering time. They are covered with fine, white hairs. The leaves are 5-parted, coarsely toothed, dark green on top and white-woolly on the undersurface. The flowers are small, about one-half inch in diameter, yellow and in leafy clusters at the ends of the branches.

CONTROL: This weed is somewhat resistant to both 2,4-D and to 2,4-D mixtures, so more than one application may be required.

Occasionally the upright cinquefoil, *P. recta*, and the rough cinquefoil, *P. norvegica*, occur in lawns. Their control is similar to that for silvery cinquefoil.

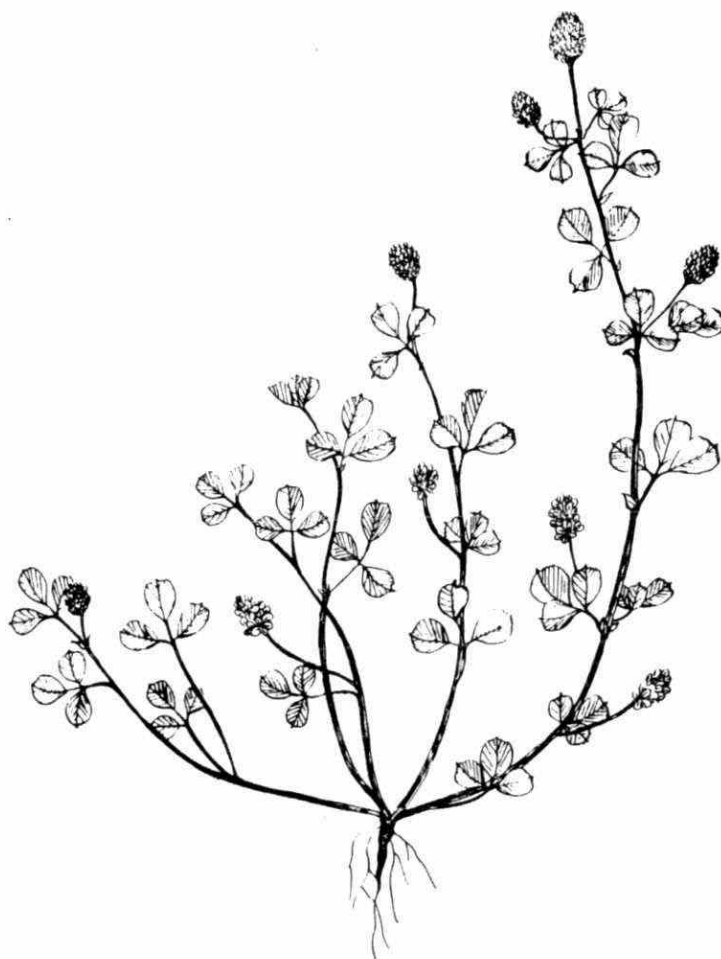


SILVERY CINQUEFOIL

BLACK MEDICK, YELLOW TREFOIL, Medicago lupulina L.

The thin, wiry stems trail along the ground. The leaves are clover-like with three rounded leaflets which are rather toothed above the middle and terminate in a sharp-pointed tip. The globular flowering heads are yellow with the flowers similar to those of the peas or beans. The seedpods are black, smooth or hairy, slightly coiled and prominently ridged.

CONTROL: Black medick is difficult to kill with 2,4-D except when very young, but is readily controlled with mecoprop, fenoprop or dicamba. The usual 2,4-D mixtures work well when applied during periods of rapid growth.



BLACK MEDICK

ROUND-LEAVED MALLOW, Malva neglecta Wallr.

The root is a taproot producing more or less prostrate stems. The leaves are long-stalked, rounded, with a deeply indented base and irregular margins. The flowers are small, hollyhock-like, white or slightly pinkish. The numerous stamens are clustered around the numerous styles. The fruit is a circle of orange-like segments around a common center.

CONTROL: This weed is difficult to control once it is established. Two or more applications of one of the 2,4-D mixtures will be required to keep it in check. Good lawn management is particularly important with these hard-to-control weeds.



ROUND-LEAVED MALLOW

GOUTWEED, Aegopodium podagraria L.

Goutweed is usually found in flower beds but its perennial underground rootstocks sometimes spread into the lawn. The basal leaves are long-stalked and have three main divisions, each of which is again 3-parted and these have toothed margins. The leaflets may be all green as in the typical species, or they may be variegated as in the variety. In flower beds where it is not subject to clipping it develops a leafy stem and an umbel of white flowers.

CONTROL: Goutweed cannot be controlled selectively by chemicals. However, it is usually not a problem in a frequently-cut lawn, and may be starved by good lawn management over a period of years.

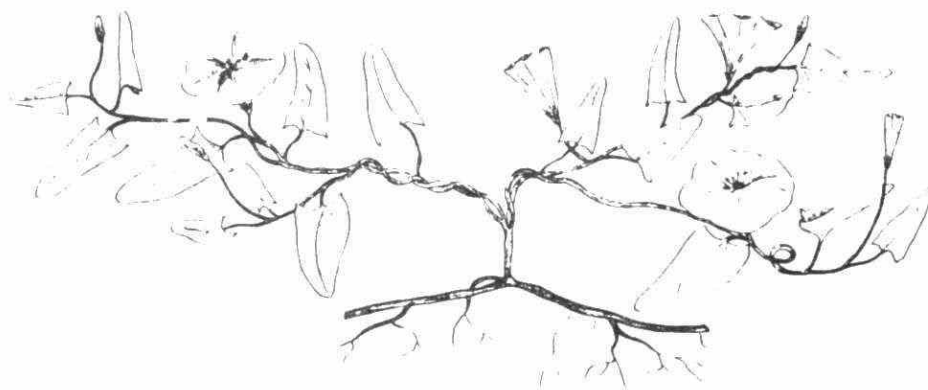


GOUTWEED

BINDWEED, WILD MORNING GLORY, Convolvulus arvensis L.

This is a perennial weed persisting by means of the deeply buried underground rootstocks. The stems are trailing along the ground, or, where there is support, they will climb. The leaves are arrow-shaped and in the young state are light green. The flowers are similar to the garden morning glory and are white or pink.

CONTROL: Several applications of 2,4-D or of a 2,4-D mixture will be required. Sprays should be applied early in June and in September. As with other deep-rooted perennials, good lawn management is a major factor in its control.



BINDWEED

CREEPING CHARLIE, GROUND IVY, Glechoma hederacea L.

The stems of this persistent perennial weed are creeping and root at each node where it contacts the ground. The leaves are opposite, rounded, or kidney-shaped, long-stalked and have wavy or toothed margins. The blue or purplish flowers are in pairs in the axils of the leaves and are irregular in shape.

CONTROL: One of the commonest lawn weeds, creeping charlie is resistant to 2,4-D but may be controlled by the 2,4-D mixtures. Early June or September treatments are best, and retreatment may be necessary.



CREEPING CHARLIE

HEAL-ALL, SELF-HEAL, Prunella vulgaris L.

This is a dwarfed, tufted plant creeping by rooting at the nodes of the stem. The leaves are opposite, small, rather elliptical or oval in shape and short-stalked. The flowers are in head-like clusters at the ends of the stems or branches. The plants form compact patches in the lawn and may never reach the flowering stage where the lawn is kept well mowed.

CONTROL: Like mouse-ear chickweed and black medick, this weed is resistant to 2,4-D. However, it may be controlled readily by treatment with the 2,4-D mixtures.



HEAL-ALL

CORN SPEEDWELL, Veronica arvensis L.

This is an annual speedwell. It has the general growth characteristics of the Speedwell species below (Purslane and Thyme-leaved) but the leaves have irregular margins and the plants are pubescent and the flowers are blue.

CONTROL: Mixtures of 2,4-D with mecoprop and/or dicamba.

In recent years *Veronica filiformis* (possibly also *V. palita*) has appeared in some southwestern Ontario lawns. It is a slender-stemmed, creeping speedwell with the blue flowers on long stalks in the axils of the leaves.

Veronica filiformis is much more difficult to control with chemicals. Good lawn management is the key to keeping it in check.

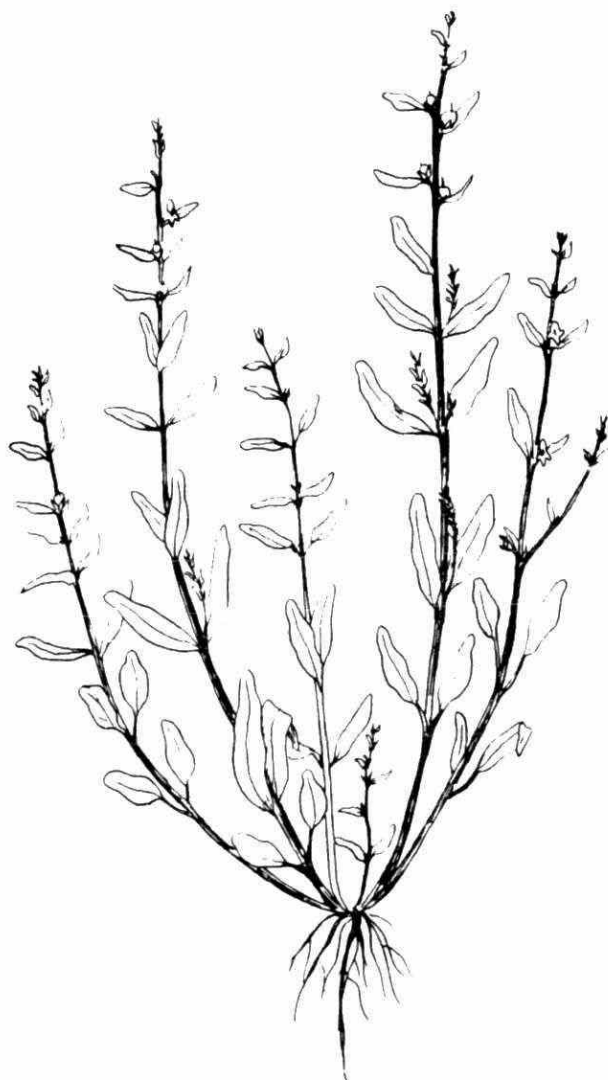


CORN SPEEDWELL

PURSLANE SPEEDWELL, Veronica peregrina L.

This species is also annual and has a rather fleshy appearance. The stems are spreading or erect, smooth, or sometimes glandular-hairy. The leaves are opposite, sessile, thickish, rather linear, or the lower ones elliptical. The small white flowers are in the axils of the upper, reduced leaves.

CONTROL: Mixtures of 2,4-D with mecoprop and/or dicamba.



PURSLANE SPEEDWELL

THYME-LEAVED SPEEDWELL, Veronica serpyllifolia L.

This is a low, creeping, bushy perennial with opposite, sessile, oval lower leaves and alternate, smaller leaves in the inflorescence. The flowers are in the axils of the reduced upper leaves and form a raceme. The petals appear to be four in number, slightly irregular, and are white or bluish with deeper purple lines. The seedpods are heart-shaped. The plants form compact patches in the lawn.

CONTROL: As with creeping charlie, mixtures of 2,4-D with mecoprop and/or dicamba are best.



THYME-LEAVED SPEEDWELL

RIBGRASS, BUCKHORN, ENGLISH PLANTAIN, Plantago lanceolata L.

The leaves are basal and form a rosette at the surface of the ground. They are long, rather elliptical, tapering to the pointed tips, and they are prominently longitudinally veined. The short spike of flowers is on a long, naked stalk. The flowers are inconspicuous, the stamens being the prominent flower part.

CONTROL: Like common plantain, ribgrass is resistant to dicamba but susceptible to the other herbicides commonly used on lawns.



RIBGRASS

COMMON PLANTAIN, Plantago major L.

This is a perennial with fibrous roots. The leaves lie close to the ground and are large, oval, prominently longitudinally veined and long-stalked. The base of the leaf stalk is green. The spike of flowers is on a long, usually leafless stalk. The flowers are inconspicuous, the stamens being the most obvious flower structure.

Regel's plantain is very similar to the common plantain but it is distinguished from it by the reddish base to the leaf stalks.

CONTROL: Easily controlled by 2,4-D, mecoprop, or fenoprop (Silvex), this weed is resistant to dicamba.



COMMON PLANTAIN

BEDSTRAW, Galium spp.

Bedstraws are weak, smooth, and square-stemmed plants with whorls of 6 to 8 club-shaped leaves. The flowers are small with four white petals.

CONTROL: This weed is resistant to 2,4-D but may be controlled with the 2,4-D mixtures. Two applications, one in May, one in September, may be required.

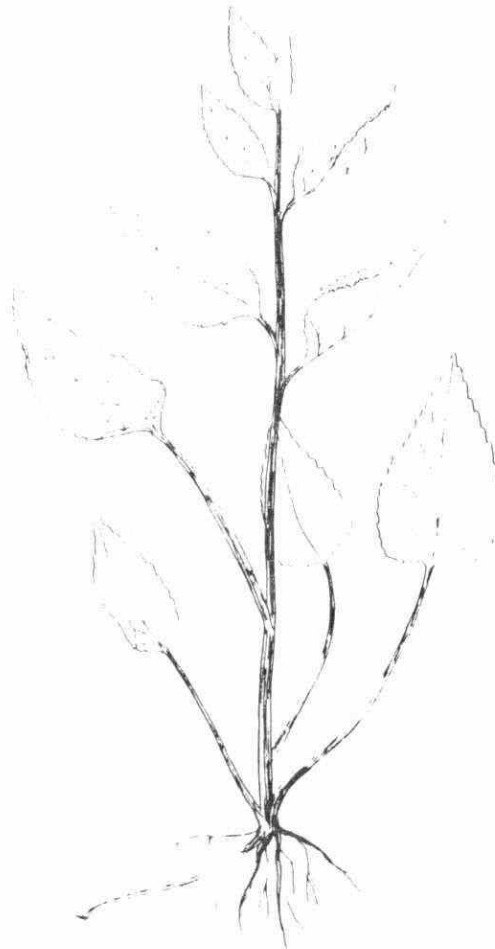


BEDSTRAW

BELLFLOWER, Campanula rapunculoides L.

This plant is sometimes grown in the flower garden and borders but spreads to the lawn by means of the creeping, underground rootstocks. The basal leaves are long-petioled, heart-shaped and with toothed margins but the upper leaves may be sessile. The flowers are in a long raceme and single in the axils of the reduced upper leaves. They are about an inch in diameter, blue, bell-like and nodding on the short stalks.

CONTROL: Bellflower is resistant to control with selective lawn herbicides. However, as with goutweed, good lawn management should soon reduce any problem brought about by the presence of this weed. Digging out clumps and reseeding will speed up control.



BELLFLOWER

YARROW, Achillea lanulosa Nutt.

The plant is easily recognized in lawns by the very finely divided, feathery leaves in bushy clumps in the grass. It spreads by means of the underground rootstocks.

CONTROL: Yarrow is difficult to control. A combination of good maintenance and 2,4-D mixtures will keep it in check. It probably will be necessary to repeat the herbicide treatment two or three times to eradicate all plants.

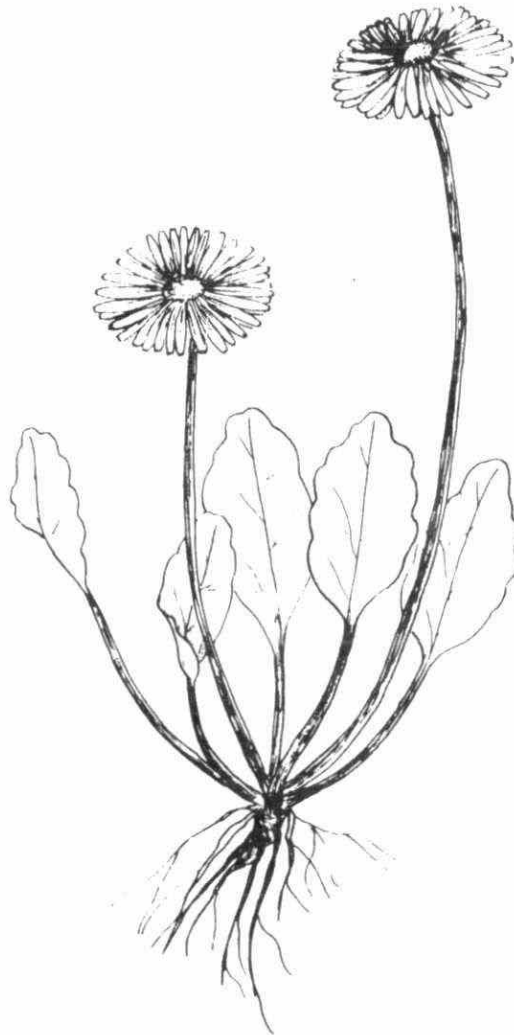


YARROW

ENGLISH DAISY, Bellis perennis L.

These are perennial plants and have a rosette of leaves lying close to the ground. The leaves are broadly oval or club-shaped with wavy or toothed margins. The head of flowers is on a leafless stalk. The heads are daisy-like with whitish or purplish ray flowers and yellow disc flowers. Once established in a lawn it practically eliminates all grass growth.

CONTROL: Good lawn management coupled with June and September treatments with a 2,4-D mixture will rid the area of this weed.

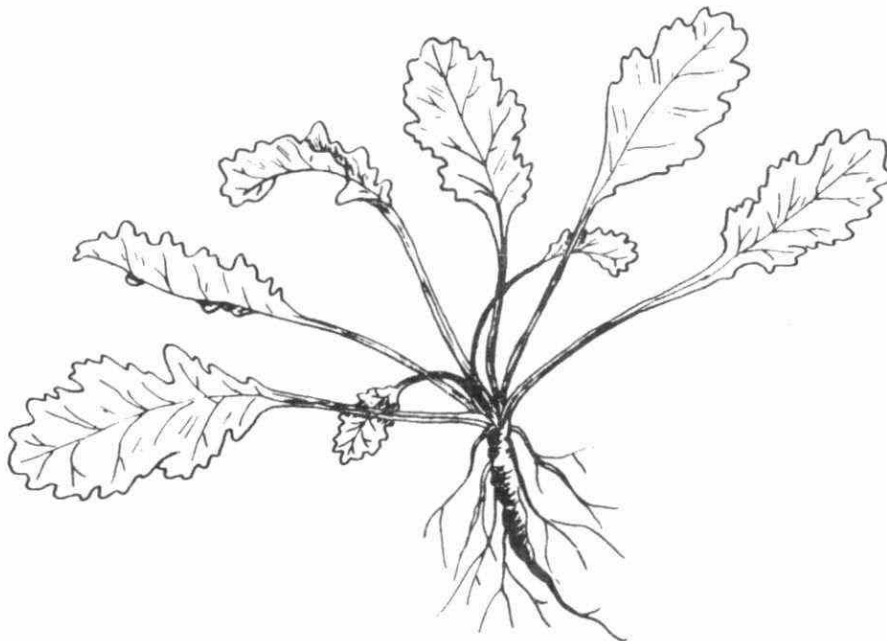


ENGLISH DAISY

OXEYE DAISY, Chrysanthemum leucanthemum var. pennatifidum
Lecoq and Lamotte

The plant has a perennial rootstock. In lawns, the leaves are close to the ground and it seldom gets a chance to flower. The leaves are dark green, rather shiny, oblong, and deeply toothed. The flowering stem, if it appears, is leafy and terminates in a daisy-like head. It forms dense tufts in the lawn grass.

CONTROL: Use 2,4-D in spring and fall. The various 2,4-D mixtures are also useful.



OXEYE DAISY

DAISY FLEABANE, Erigeron annuus (L.) Pers.

The roots are fibrous and annual or biennial. The leaves are rather large, long-stalked, elliptical, and coarsely toothed. In lawns it seldom flowers but if it does the flowers are daisy-like.

Philadelphia fleabane may also appear in lawns but in the early stages it is difficult to distinguish from the species above. However, the leaves are usually sessile and the margins of the leaves are not toothed.

CONTROL: Two applications of 2,4-D or a 2,4-D mixture will eliminate this weed from a lawn. It is seldom found in an established, well maintained lawn.

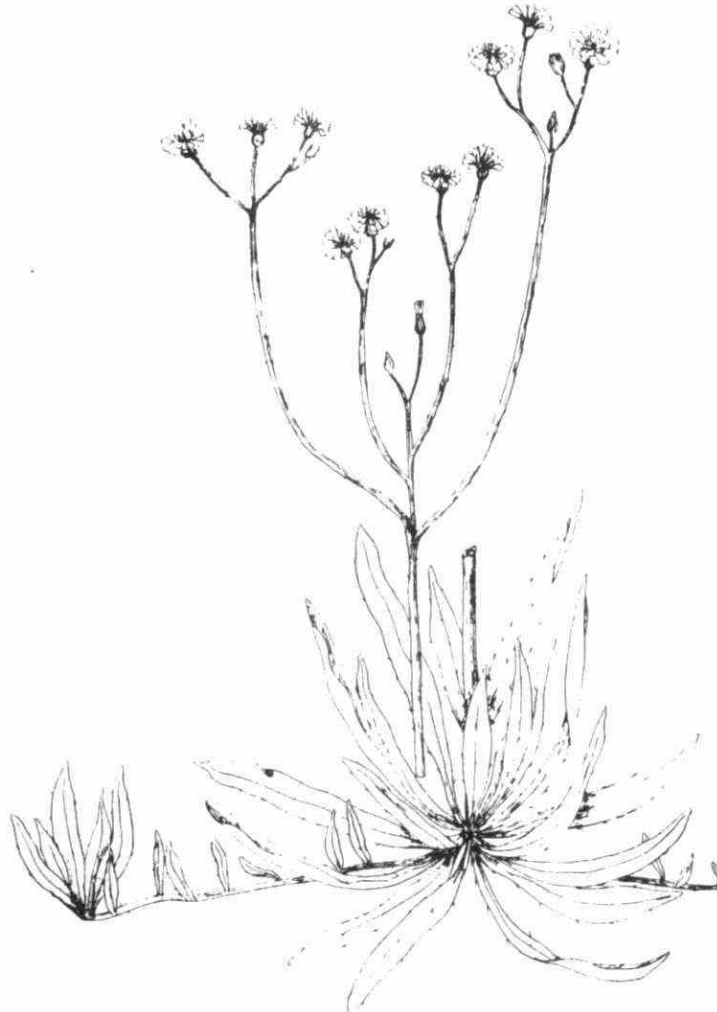


DAISY FLEABANE

HAWKWEEDS, Hieracium spp.

There are a number of hawkweeds that may appear in lawns. Since mowing modifies their appearances greatly, it is difficult to determine the particular species that may be present. In general they have basal leaves which are broadly club-shaped, usually hairy and with or without runners. If the flowers do form, they are small, dandelion-like and have long, leafless stalks.

CONTROL: Two applications of 2,4-D or a 2,4-D mixture coupled with good lawn maintenance practices will eliminate this weed.



YELLOW HAWKWEED

DANDELION, Taraxacum officinale Weber.

This weed, of worldwide distribution, is so well known that a description would be superfluous.

CONTROL: Easily controlled with 2,4-D.

FALL DANDELION, Leontodon autumnalis L.

The plant produces a rosette of leaves similar to the common dandelion but the blades are much more finely toothed. The flowering stem is tall, slender, and often branching. The heads of yellow flowers are dandelion-like but smaller.

CONTROL: Easily controlled with 2,4-D.



FALL DANDELION

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QUESTIONS ON CORRESPONDENCE COURSE

WEED CONTROL IN LAWNS

1. Give three reasons why the recommended "chemical weed control" may not always be 100% effective.
2. List three (3) factors that may affect this poor control.
3. List four (4) reasons why fertilizer is used on lawns.
4. Name four (4) herbicides recommended for use on most annual "broadleaf" weeds, in lawns. Also indicate the recommended rate of application for each.

5. List five (5) factors of importance in good lawn "management".

- Dandelions

Crab Grass

Mushrooms

Moss

Creeping Charlie

Creeping Buttercup

Black Medic

7. What OMAF publications can be used to obtain information and to assist you in treating lawn weeds properly?

8. Should an operator use the same sprayer for herbicides and insecticides? Give the reason for your answer.

QUESTIONS (Cont'd)

9. Answer true or false.

- (a) 2,4-D will kill most broadleaf weeds. _____
- (b) Mixtures of herbicides are often more effective than one used alone. _____
- (c) Use of herbicide will guarantee a beautiful lawn. _____
- (d) Plantain and dandelions are controlled by different herbicides. _____
- (e) Weeds are more easily killed when they are dormant. _____
- (f) Creeping Charlie is resistant to dicamba mixtures. _____
- (g) Common peppergrass is susceptible to 2,4-D. _____
- (h) Chlorate weed killers have more hazardous properties than most herbicides. _____
- (i) Ester formulations are safer to apply. _____
- (j) Herbicides should not be stored near fungicides, insecticides, fertilizers and other chemicals. _____

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